

TOP SECRET RUFF

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Attachment to

6 July 1967

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REFERENCE TO:

POSSIBLE SURFACE EFFECT SHIP
(RAM-WING CONCEPT)
KASPIYSK, USSR

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1. SIGNIFICANCE:

THE LARGE AERO (OR HYDRO) DYNAMICALLY SHAPED OBJECT

[REDACTED] IS NOW IDENTIFIED AS

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A POSSIBLE SURFACE EFFECT SHIP EMPLOYING THE RAM-

WING CONCEPT. [REDACTED] THE SHIP WAS ASSEMBLED

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AND HAD LEFT KASPIYSK.

2. LOCATION:

8 NM SE OF MAKHACHKALA AND ADJACENT TO THE MAKHACHKALA
AMMUNITION PLANT DVIGATEL 182.

3. REMARKS:

A GENERIC TERM, SURFACE EFFECT SHIPS HAS BEEN APPLIED
TO A WHOLE FAMILY OF CRAFT INCLUDING: HOVERCRAFT, AIR
CUSHION VEHICLES, GROUND EFFECT MACHINES, FLEXIBLE
SKIRT CRAFT, PERIPHERAL JETS AND THE CAPTURED AIR
BUBBLE CRAFT. A SURFACE EFFECT SHIP IS DEFINED AS A
SHIP OR CRAFT WHERE THE MAJOR PORTION OF THE WEIGHT IS
BORNE BY A VOLUME OF HIGHER THAN AMBIENT PRESSURE AIR
WHICH IS TRAPPED IN SOME WAY BENEATH THE STRUCTURE OF
THE SHIP. THE RAM-WING CONCEPT INVOLVES OPERATING AN

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GROUP 1
Excluded from automatic
downgrading and declassification

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AIRFOIL-SHAPED BODY (WING) CLOSE TO THE OPERATING SURFACE. THE APPROACH IS TO SUBJECT THE RAM-WING TO FORWARD MOTION CREATING IMPACT AIR PRESSURE BETWEEN IT AND THE SURFACE RESULTING IN LIFT. THEORETICALLY, AS THE WING RISES FROM THE GROUND THE INDUCED DRAG APPROACHES ZERO AND THE THRUST REQUIRED FOR PROPULSION IS REDUCED, WITH ONLY THE SKIN DRAG TO BE OVERCOME. THE MAJOR REASON WHY THERE IS SO MUCH INTEREST IN SURFACE EFFECT SHIPS IS THE HIGH SPEED POTENTIAL.

SURFACE EFFECT SHIPS ARE ESSENTIALLY CONSTRUCTED SIMILAR TO AIRCRAFT. IT APPEARS DOUBTFUL THAT CONSTRUCTION CRITERIA OF DISPLACEMENT SHIPS WILL EVER BE SUITABLE FOR SURFACE EFFECT SHIPS DUE TO WEIGHT LIMITATIONS. ACCORDINGLY IT WOULD APPEAR THAT AS SIZES GO UP THERE WILL BE A MELDING OF AIRCRAFT AND SHIP CONSTRUCTION TECHNIQUES. IT MAY BE NECESSARY TO DEVELOP A NEW TECHNOLOGY. CONSTRUCTION COSTS WILL PROBABLY FALL SOMEWHERE IN THE SPECTRUM BETWEEN AIRCRAFT AND HYDROFOIL CONSTRUCTION COSTS. (U.S. NAVAL INSTITUTE, PROCEEDINGS, NOV 1966, U)

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4. COLLATERAL: NONE5. FIRST IDENTIFICATION:

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6. NEGATION DATE:7. SUBSEQUENT COVERAGE: 1 KH-4 AND 1 KH-78. DIMENSIONS/
SPECIFICATIONS:

LENGTH OVERALL: 320 FT

FUSELAGE DIAMETER: 20 FT

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WING ROOT CHORD: 60 FT

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9. MISSION READOUT: THE PREVIOUSLY REPORTED AERO (OR HYDRO) DYNAMICALLY CONFIGURED OBJECT IS NOW IDENTIFIED AS A POSSIBLE SURFACE EFFECT SHIP EMPLOYING THE RAM-WING CONCEPT. IT IS OBSERVED AT ITS PREVIOUS POSITION ON ALL PASSES EXCEPT THE LAST PASS. THE BARGES ON WHICH THE POSSIBLE SURFACE EFFECT SHIP HAD BEEN ASSEMBLED WERE PUSHED ASIDE AND THE SHIP WAS NOT OBSERVED IN THE IMMEDIATE AREA OF THE PLANT OR IN THAT PORTION OF THE CASPIAN SEA IMAGED ON PHOTOGRAPHY. STEREO PHOTOGRAPHY FROM PASS 90D MAKES POSSIBLE A MORE ACCURATE DESCRIPTION OF THE SHIP. IT HAS A LONG SLENDER FUSELAGE RESEMBLING AN AIRCRAFT FUSELAGE

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WITH SHORT STUBBY WINGS WHICH APPEAR TO HAVE FLAPS. THE FUSELAGE TAPERS UPWARD IN THE REAR AND FORMS A HIGH V-SHAPED STABILIZER. NEWLY IDENTIFIED ARE 8 ENGINE NACELLES MOUNTED ON THE FUSELAGE, 4 ON EACH SIDE, FORWARD OF THE WINGS NEAR THE NOSE. THE NACELLES ARE MOUNTED HIGHER ON THE FUSELAGE THAN THE WINGS. NO PROPELLERS ARE VISIBLE.

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